

**PATENT****Docket No. MWH-0029US****Response (to Office Actions of January 7, 2003, June 26, 2003, and October 7, 2003) filed  
October 12, 2003  
U.S. Appl. No. 09/856,803**

This listing of claims will replace all prior versions and listings of claims in the application:

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**Listing of Claims:**

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**Claim 1 (currently amended): A method for genotyping the  $\beta_2$ AR gene of an individual, which comprises determining the identity of the nucleotide pair at the 5' leader cistron (5'LC) polymorphic site (PS) in the two copies of the  $\beta_2$ AR gene present in the individual, wherein the nucleotide pair is selected from the group consisting of: (a) cytosine and cytosine; (b) cytosine and thymine; and (c) thymine and thymine.**

**Claim 2 (original): The method of claim 1, wherein the determining step comprises**

- (a) isolating from the individual a nucleic acid mixture comprising both copies of the  $\beta_2$ AR gene, or a fragment thereof, present in an individual;**
- (b) amplifying a target region containing the 5'LC PS; and**
- (c) detecting the presence of one or both of cytosine or thymine at the 5'LC PS.**

**Claim 3 (original): The method of claim 2, wherein the detecting step comprises:**

- (a) incubating the amplified target region with MspAI; and**
- (b) analyzing the incubation mixture for the presence of MspAI digestion products.**

**Claim 4 (original): The method of claim 2, wherein the detecting step comprises hybridizing the amplified target region with an allele-specific oligonucleotide (ASO) probe**

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which specifically hybridizes to a  $\beta_2$ AR 5'LC allele comprising the thymine polymorphism or to a  $\beta_2$ AR 5'LC allele comprising the cytosine polymorphism.

**Claim 5 (original):** The method of claim 4, wherein the ASO probe comprises a nucleotide sequence selected from the group consisting of SEQ ID NO:5, the complement of SEQ ID NO:5, SEQ ID NO:6, and the complement of SEQ ID NO:6.

**Claim 6 (original):** The method of claim 2, wherein the detecting step comprises sequencing the amplified target region.

**Claim 7 (original):** The method of claim 2, wherein the amplifying step is performed by the polymerase chain reaction method using at least one allele-specific primer which specifically hybridizes to a  $\beta_2$ AR 5'LC allele selected from the group consisting of a first  $\beta_2$ AR 5'LC allele comprising the thymine polymorphism, the complement of the first  $\beta_2$ AR 5'LC allele, a second  $\beta_2$ AR 5'LC allele comprising the cytosine polymorphism, and the complement of the second  $\beta_2$ AR 5'LC allele.

**Claim 8 (original):** The method of claim 7, wherein the allele-specific primer is selected from the group consisting of SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9 and SEQ ID NO:10.

**Claim 9 (withdrawn)**

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**Claim 10 (withdrawn)**

**Claim 11 (original):** The method of claim 1, which further comprises determining the identity of the nucleotide pair at one or more additional polymorphic sites in the  $\beta_2$ AR gene.

**Claim 12 (withdrawn)**

**Claim 13 (currently amended):** A composition comprising at least one allele-specific oligonucleotide (ASO) that specifically hybridizes to a  $\beta_2$ AR polynucleotide at a region containing the 5'LC polymorphic site, wherein the ASO is not less than 10 nucleotides in length and not more than 100 nucleotides in length.

**Claim 14 (original):** The composition of claim 13, wherein the ASO is a probe comprising a nucleotide sequence selected from the group consisting of SEQ ID NO:5, the complement of SEQ ID NO:5, SEQ ID NO:6, and the complement of SEQ ID NO:6.

**Claim 15 (original):** The composition of claim 13, wherein the ASO is a primer comprising a nucleotide sequence selected from the group consisting of SEQ ID NO:7, SEQ ID NO:8, SEQ ID NO:9 and SEQ ID NO:10.

**Claim 16 (withdrawn)**

**Claim 17 (withdrawn)**

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Claim 18 (withdrawn)

Claim 19 (withdrawn)

Claim 20 (withdrawn)

Claim 21 (withdrawn)

Claim 22 (canceled)

Claim 23 (withdrawn)

Claim 24 (canceled)

Claim 25 (canceled)

Claim 26 (withdrawn)

Claim 27 (withdrawn)

Claim 28 (withdrawn)

Claim 29 (withdrawn)